



Jamipol has patented a new process for producing low-phosphorous steel through induction furnaces, which meets the quality norms laid down by the Bureau of Indian Standards.

THE CONTEXT



India is the second-largest steel producer in the world, but around 30% of the 100 million tonnes it produces every year is manufactured using induction furnaces and does not always meet the required quality norms. The Bureau of Indian Standards (BIS) has restricted the phosphorous limit in rebars to less than 0.045%. Induction furnaces that use low-and-medium-grade sponge iron as raw material do not meet this limit.

The secondary steel sector faces the risk of closure due to non-compliance of quality standards, imperilling the jobs of thousands of steel workers and leading to a potential loss of gross domestic product (GDP). Moreover, since a higher quantity of phosphorous affects the mechanical properties of steel, induction furnaces also pose a safety threat to surrounding buildings and other plant structures. These concerns prompted Jamipol to develop a new process for achieving the required phosphorous limit in steel produced through induction furnaces.

THE INNOVATION



Jamipol developed a dephosphorising reagent and a novel process for producing low-phosphorous steel in induction furnaces that use low-grade sponge iron or poor quality steel scrap as raw material. The innovative process entailed using a special refractory lining in the induction furnace so as to mitigate any risk of leakage arising from the use of the dephosphorisation compound to produce the desired steel quality. Jamipol won a patent for this technology in November 2018.

KEY CHALLENGES



TO PREVENT THE QUICK EROSION OF THE INDUCTION FURNACE'S REFRACTORY LINING

The use of the new dephosphorisation material increases the risk of damage to the furnace. Since the process erodes the furnace's refractory lining, the team came up with the idea of using a special lining that would reduce the risk of damage to both the lining and the induction furnace.

DEVELOPING A TECHNOLOGY THAT IS COST-EFFECTIVE

The team kept costs under control by avoiding the use of any external treatment and by developing a technology that used a dephosphorisation product that could be used by existing induction furnaces.

POTENTIAL IMPACT



The new process can result in an estimated benefit of over

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for the secondary steel sector based on a price premium of Rs2,000 per tonne on low-phosphorous steel produced in an induction furnace. This is expected to accelerate secondary steel production in small-and-medium-scale units across India, thereby increasing employment opportunities and contributing to the country's economic growth.